failure of the tables in the Japanese light-houses, I feel sure that much of the objectionable innuendo to which I have been subjected would never have been penned. JOHN MILNE

s.s. *Waihora*, Hobart, Tasmania

P.S.—The above has been written whilst at sea, and I have neither had opportunity to refer to books or papers. On my return to Japan I shall be glad to continue the history of the ball and plate joints, should it be required.

Tremble-terre du 26 Septembre, 1885

UNE seule secousse a été constatée le 26 Septembre à oh. 58m. du matin ; elle a été composée de 2 à 3 oscillations, de direction variable suivant les localités. Le centre de la secousse a été dans le milieu du Valais, où son intensité a été appréciée comme très-forte, mais où il n'y a cependant pas eu de dégâts matériels ; il faut lui attribuer le No. VI. de l'échelle qui évalue en dix degrés l'intensité des tremblements de terre.

La secousse s'est étendue vers le nord jusqu'à Schwenden et Zweisimmen dans le Simmenthal, à Château d'Oex, Aigle et Yvorne ; dans les Alpes vaudoises elle a été fort bien sentie dans les vallées de l'Avençon, de la Gryonne, de la Grande-eau, et de la Savine. Dans tout le reste du canton de Vaud le tremble-terre semble avoir passé inaperçu, tandis qu'il nous est signalé de deux localités fort distantes, Genève et Nidau ; il est cependant probable que la secousse de Nidau a précédé de quelques minutes la grande secousse du Valais ; d'après un observateur très précis la secousse de Nidau a eu lieu à oh. 53m.

En même temps que le sol de la Suisse était ainsi ébranlé, les appareils très délicats de l'observatoire sismique de Rome, qui avaient été en repos les jours précédents, ont signalé des vibrations du sol vers 1 heure du matin ; et dans le même nuit un violent tremblement de terre ravageait la ville de Nicolosi près de Catane en Sicile. F.-A. FOREL

Morges, 8 Octobre

Larvæ of Cerura vinula

LAST year I was rearing up some larvæ of *Cerura vinula*, the Puss Moth, from the egg, and I determined, while I had the chance, to write a life-history of them.

On examining the egg closely I found a small hole in the apex of each, and I thought at the time that this was probably caused by ichneumons, and therefore I laid the eggs by in a small box that I might capture the ichneumons when they made their appearance. Great was my surprise, then, when I found that the young larvæ came out as usual.

I therefore determined to get some more eggs and to find out whether this hole in the apex was caused by the mandibles of the larva inside, but I found that the larva did not emerge by this hole, but by a fresh one made in the side of the egg. And I find that all Puss Moth eggs have this hole in the apex.

I am now hoping to get some eggs of moths belonging to the same family (*e.g. Cerura furcula* and *bifida*) to see if they also are perforated in this way. I should be much obliged if any one who has got any of these eggs would kindly let me know whether this is the case.

This hole reaches through the shell of the egg, but is covered, on the inside (of the egg) with a thin tissue, like that which is found in birds' eggs.

I have carefully examined several scientific books, but have been unable to find this fact mentioned ; therefore I should be much obliged if any one could throw a light on this mysterious fact.

I unfortunately have none of these eggs to forward as examples ; but, as they are pretty common in May and June on poplar trees, I have no doubt that such of your readers as are interested in the subject will be able to examine them for themselves. CYRIL B. HOLMAN HUNT

Draycott Lodge, Fulham, October 9

Pulsation in the Veins

I AM quite satisfied that the pulsatory movement in the veins, to which my former communication referred, is not in any way *abnormal*, as suggested by Mr. Williams (p. 466). In *all* cases, without exception—and they have been a good many—in which I have had opportunity for the observation, the minute *visible* evidence of the pulsatory action has been present, and I have invariably been able to count the pulse of the individuals, as in the experiment detailed in my former letter.

The mirror experiment was tried on my own hand. And a medical friend who applied the sphygmograph in the usual way informed me that my pulse was free from any abnormality.

It is to be borne in mind that the pulsatory indications with which my paper is concerned are exceedingly minute and would escape the perception of nine persons out of ten—requiring an eye educated to appreciate very minute differences of shade and colour. I do not think that the bristles or sealing-wax thread which a correspondent (p. 437) kindly suggests, or even the orthodox sphygmograph would have a chance of effectually exhibiting them. I say shade *and colour*: for when a vein free from turgidity, and not sensibly altering the smooth surface of the skin, is seen only by its blue track, a modification of the *tint* is perceptible (to an educated eye) ; and the blue varies in intensity with the pulsatory action, sufficiently for the success of the pulse-counting experiment. J. HIPPISLEY

Stoneaston Park, October 4

Stonehenge

IN NATURE, vol. xxxii. p. 436, R. Edmonds associates Stonehenge with the metonic cycle, and quotes from Diodorus Siculus, whom he says flourished about 44 B.C. Would not the latter part of the first century A.D. be more accurate? He gives in his extract from Diodorus Siculus a quotation from Hecatæus, whom he confuses with Hecatæus of Miletus, when it was Hecatæus of Abdera to whom Diodorus referred. Hecatæus of Miletus flourished about 500 B.C., and Hecatæus of Abdera about 300. Mr. Charles Elton, M.P., in his "Origins of English History," gives the very same extract, and says that "We cannot admit that the work of Hecatæus is on the subject of Ancient Britain," and estimates its value in the following extract from the works of an eminent Polish scholar (Lélewel, Pythéas, 45) : "Hécatée a publié un fameux ouvrage dont le titre décèle une vieille idée poétique rajeunie sous sa plume. Elle devait s'allier aux nouvelles découvertes et y prendre une place éminente au détriment de la science et du bon sens. Hécatée, énumerant tous les êtres mystérieux de la géographie septentrionale, enrichit leur nomenclature d'une rivière Scythique récemment trouvée en Orient par le conquérant, qu'il a appelée Parapamisos ; et plus encore des promontoires et des îles Celtiques, qu'il a probablement puisées dans les rélations véridiques de Pythéas pour les entrelacer dans les plages superboréennes."

The quotation from Diodorus is from his second book, but the whole of this second book is dedicated solely to a description of Asia ; and it is not until the fifth book is reached that he describes the British Isles, and with a very considerable degree of accuracy. (See Fergusson's "Rude Stone Monuments," p. 8).

I do not think, either, that "Nine Maidens" is simply an abbreviation of "Nineteen Maidens," for, like "Nine Ladies" of Stanton Moor, in Derbyshire, it is a memorial circle.

Stone Henge, moreover, is much more probably a memorial circle, as its original name implies—"Stan Hengis" ; and commemorates the massacre of Vortigern's chiefs by Hengist in 462 A.D. The Rollright circle probably commemorates the victory of Rollo over Eadward, circ. 913, whilst Avebury and Hakpen (520), Kit's Coty House (455), Long Meg and her Daughters (508-520), Stanton Drew (508-520), Arthur's Table, Arbor Lowe, Cumrew, Salkeld and Mayborough commemorate some of the victories of Arthur. That this is reasonable may be mentioned the facts that coins of Claudius Gothicus (270 A.D.), Constantine the Great, Constantine junior, and Valentinian have been found at one or other.

Milverton, Leamington SAND. S. STANLEY

The Forecasting of Barometric Variations

IN a paper published in the *Journal* of the Royal Meteorological Society, vol. x., p. 219, 1884, I pointed out that during a series of years the barometric variations in Western India had presented certain features which, had they been known at the beginning of 1876, and, indeed, at the beginning of 1872, would have made it possible to have calculated with a considerable degree of precision and reliability the general course of the barometric variations from 1872 up to 1883, in some cases three

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months, and in some cases even twelve months beforehand. The facts brought forward in that paper were of such a nature that, as will be readily understood, I wished very much they could be found to occur generally. But it was undoubtedly better to restrict their application to the area and period dealt with in the paper. It having been shown, however, that at one period and over a certain area quantitative relations had existed between previous and subsequent barometric variations, it is natural to suppose that quantitative relations may be found to exist at other periods and over other areas also. The question arises, Can the facts brought forward in the above-mentioned paper serve as a guide to future investigation? I think to a certain extent they can.

The paper pointed out that there was a remarkable approach to an annual symmetry in the abnormal variations of the barometer in Western India during many of the years under observation. It supposed that this symmetry would have occurred every year during that period had it not been masked by larger variations of another character; and it was mainly by acting on this supposition and noting the departure from symmetry in any given year, and by considering that departure as being an index of the variation that was about to come, that the position of the barometer in the subsequent year was calculated. The paper attempted to explain the occurrence of this annual symmetry in two ways: (1) By supposing it to be a constant phenomenon connected with the annual double oscillation known to be present in the normal barometric curve; and (2) by supposing it to be a chance phenomenon, characterising a phase in the march of barometric variations, and persistent during the period dealt with, but not necessarily to be found in any other period. After further reflection I am inclined to believe that the latter is the correct explanation.

And here I think may be a guide to future investigation. It seems very likely that barometric variations may always be passing through phases which are persistent for several years. And, during the continuance of each phase the abnormal barometric curve will necessarily approach more or less to a certain annual type. In the cases dealt with in my paper that type chanced to be of a symmetrical form, sufficiently remarkable to strike the eye at once. The regularity of its form made it comparatively easy to be dealt with. An irregular type would of course be less easy to recognise and less easy to be dealt with. But it is obvious that if such types do exist and persist for several years in succession, then, by catching the type as the barometric phase comes in and by noting the departures from it each year, in a manner similar to that adopted with the symmetrical type I had to deal with, these departures may serve also in a similar manner as indices of the coming variations. Of course the methods of calculation would have to be purely arbitrary and specially devised for each barometric phase. If barometrical curves would yield to strictly mathematical methods, the problem of season-forecasting could be regarded as in a fair way of being solved. But it has never yet been found possible to resolve them entirely into regular periodical oscillations; and I believe they will always have to be arbitrarily dealt with.

Melbourne, July 21 A. N. PEARSON

Transmission of Sound

IN connection with the subject of mechanical telephones, which has been occupying public attention lately, there is a note by Mr. Miller in a recent number of NATURE, regarding certain experiments made in 1878 on the propagation of sound. With reference to this, Prof. Wernhold, of Chemnitz, writes to me, saying that as early as 1870 he had shown that human speech could be transmitted very distinctly through stretched wires or threads, and mentions that the results of his researches were published in an article on "The Transmission of Human Speech through an Iron Wire," in Carl's "Repertorium für Experimental Physik," Band vi., Serie 168. As your correspondent will probably like to refer to this, may I ask you to kindly publish this letter? W. E. AYRTON

Central Institution, Exhibition Road, London, October 12

Are there Rabbits in the Western Islands?

PROF. THOROLD ROGERS in his interesting book on "Work and Wages" mentions the relatively high value of rabbits in the thirteenth century, and suggests that they were then a recent introduction to England. It is well known that several islands on the west coast of Scotland have no rabbits upon them—for instance, Kerrera, which seems to point to the same conclusion. It would be interesting to know whether this is really the fact or not? HERBERT ELLIS

112, Regent Road, Leicester, October 4

THE HELL-GATE EXPLOSION

PROBABLY the largest chemical mechanical experiment ever thought of was successfully performed last week in New York Harbour by the removal of the obstruction known as Hell Gate, or Flood Rock, a considerable-sized island, as stated by the papers, about nine acres in extent, in Long Island Sound. The agent employed for this immense engineering work is a preparation or preparations of nitro-glycerine, and there is no doubt that this is the only explosive compound which could have been used for the purpose on account of the very enormous quantity required and the peculiar nature of the explosion of this substance. All the compounds or preparations of nitro-glycerine produce by explosion what are known as local effects only, as distinguished from gunpowder, the effects of which are much more gradually developed on ignition, but extend, owing to the slower and larger wave of disturbance, to a much greater distance. The legitimate use of nitro-glycerine is for purposes such as this, where a disruptive action is required.

The operations leading up to the final explosion have been some years in progress. They have consisted in forming a system of tunnels at a considerable depth under low-water level in the solid rock, and the charging of these tunnels with dynamite and mixtures known as rackarock, of nitro-glycerine with compressed gun-cotton. Twenty-four galleries were driven through this island, some of them 1200 feet long, and these were intersected by some forty-six others. These tunnels were about 10 feet high and 8 feet wide, and the roof of rock above them varied from 10 to 25 feet in thickness. The quantity of rock to be removed by the explosive was about 275,000 cubic yards, the quantity removed by tunnelling being about 80,000 cubic yards. A good deal of trouble has been occasioned during the course of the mining work by fissures, which have had to be stopped by wooden plugs in most instances. The explosive was charged into holes drilled into the roof and supporting walls and pillars at different angles, with a view to disrupt the strata of rock as much as possible.

The holes to be charged were about 9 feet in length and $2\frac{1}{2}$ inches in diameter. The holes were charged first with the blasting gelatine or rackarock and filled to the ends with a dynamite cartridge, to which the detonator and electric wire were attached. In all fourteen thousand cartridges of a total weight of fourteen tons were employed. Near observers describe the explosion as being accompanied by a dull roar, but with only the slightest shaking of the ground, even at a moderate distance. An immense quantity of water was bodily raised up to heights estimated variously at 150 to 200 feet.

The results, as far as can be ascertained, are very satisfactory, the rock having been very thoroughly broken up, so that it can easily be dredged away.

After the example of an experiment on this scale, carried out without the least accident, perhaps it may occur to those in authority that we have on our own coasts dangerous rocks, not of the extent of Flood Rock, which might with immense advantage be similarly "chemically" removed.

Had gunpowder been the only explosive available, at least five times the quantity by weight of the nitro-glycerine preparations used in this experiment, would have been necessary and the results would not have been by any means so local or perhaps so satisfactory.

After this the engineer may find it to his advantage to cultivate more the acquaintance of the chemist and his products than has been hitherto the case.

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